REMARKS

The Examiner is thanked for a very thorough and detailed Office Action. Pursuant to that Office Action, claims 1-13, 16-17 and 19 have been cancelled, and claims 14-15, 18 and 20-25 have been rewritten to more definitely set forth the invention and obviate the rejection. Support for the amendment of Claims 14-15 can be found in original Claims 16, 17 and 19. Support for the subject matter of new claims 26-27 can be found in original claims 18 and 21. The present amendment is deemed not to introduce new matter. Claims 14-15, 18, and 20-27 remain in the application.

With regards to the claiming of the priority of Japanese patent application 2002-314333, filed October 29, 2002, applicants submit herewith a certified copy of same. In addition, attached hereto is an English translation of same. In view of the submissions herewith of the certified copy and English translation of the Japanese priority application, it is believed that applicant has now complied with 35 U.S.C. 119(b). Granting of priority of Japanese application 2002-314333, filed October 29, 2002, is accordingly respectfully requested.

Reconsideration is respectfully requested of the rejection of Claims 17-18 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 17 has been cancelled. Further, claim 18 has been amended to now be dependent upon base claim 14. In view of the cancellation of claim 17, and the amendments to claim 18, it is believed that the rejection is now moot. Withdrawal of the rejection is accordingly respectfully requested.

Reconsideration is respectfully requested of the rejection of claims 14-18 and 20-25 under 35 U.S.C. 102(b) as being anticipated by Van Antwerp, et al. (US Patent No. 6,413,393, issued July 2, 2002).

The cited Van Antwerp, et al. reference discloses sensors including UV-absorbing polymer, and a method of manufacturing same. These sensors are, in particular, thin film electrochemical sensors for in subcutaneous or transcutaneous monitoring of blood glucose levels in a diabetic patient. For example, the sensors can be implantable biosensors. The sensors of Antwerp, et al. were developed to overcome the problem encountered with prior art sensors, in that the ablation process and subsequent expulsion of vaporized polyimide can cause delamination of the adjacent portions of the polyurethane layer from the underlying polyimide layer (see column 2, lines 8-13).

The sensor "includes a base layer, a cover layer and a sensor element disposed between the base and cover layer" (column 2, lines 37-40). The sensor includes a functional coating layer as well, which is composed of a UV-absorbing polymer. The UV-absorbing polymers are formed from a reaction mixture including a diisocyanate, at least one selected from the group consisting of a diol, a diamine and mixtures thereof, and a polyfunctional UV-absorbing monomer (see column 4, line 63, to column 5, line 3).

In contrast, the present invention, as now claimed in amended claim 14 herein, provides an apparatus *for analyzing a base sequence*, comprising:

a first board having a front surface;

a thin polymeric gel film formed on the front surface of the first board for allowing a base

sequence test sample to be stretched and immobilized on the thin film, said thin polymeric gel film having depressions and projections, said projections and depressions having a pitch within a range of from 0.1 μm to 10 μm;

a heating means for heating and vaporizing the thin polymeric gel film in a desired region; and

a second board disposed opposite the thin polymeric gel film.

Further, as now claimed in amended base claim 15, the present invention provides an apparatus for analyzing a base sequence, comprising:

a first board having a front surface;

an ablation layer formed on the front surface of the first board, said ablation layer being formed of a material capable of being vaporized by heating of the ablation layer;

a thin polymeric gel film formed adjacent the ablation layer for allowing a base sequence test sample to be stretched and immobilized on said thin film, said thin polymeric gel film having depressions and projections, said projections and depressions having a pitch within a range of from 0.1 μm to 10 μm;

a heating means for heating and vaporizing the ablation layer in a desired region; and

a second board disposed opposite to the front surface of the first board.

The cited Van Antwerp, et al. reference fails to disclose an apparatus for analyzing a base sequence, including "*a thin polymeric gel film formed on the front surface of the first board for allowing a base sequence test sample to be stretched and immobilized on the thin film, said thin polymeric gel film having depressions and projections, said projections and depressions having*

a pitch within a range of from 0.1 μm to 10 μm", as now claimed in all claims herein. The apparatus of the present invention, which includes said thin polymeric gel film, allows the immobilization, electrostatic orientation, and stretching of DNA upon same, such that the DNA may be cut at the depressions 6 formed in the thin film.

Cutting of DNA using the apparatus of the present invention can be carried out sequentially, and may be used to analyze the entire base sequence. Upon cutting of the DNA via heating/irradiation of the above-mentioned film, the DNA attached to and immobilized on the projections 5, because of the steric hindrance caused by adsorption on the projection, is obtained (shown as DNA fragment 7 in Figures 3 and 4). Thus, DNA fragments 7 supported on the projections 5, as shown in Figure 3, can be obtained, and their order easily determined.

Further, the Van Antwerp, et al. reference relates to biosensors, namely subcutaneous and transcutaneous biosensors. These biosensors are completely unrelated to the art or purpose of the apparatus claimed herein. Moreover, the "thin film" that "has depressions and projections formed at a "very small pitch", as referred to by the Examiner in the second paragraph on page 5 of the instant Office Action, is, in fact, separate sensor elements 14. These sensor elements 14 are formed between base layer 16 and cover layer 18, and are NOT a continuous film as claimed herein. Therefore, it is strongly urged that the claimed structure of the present apparatus, as well as the use for same, comes only from the present invention, and constitutes an important element or aspect thereof.

In view of the amendments to claims 14 and 15 herein, as well as the deficiencies of the cited Van Antwerp, et al. reference pointed out above, it is believed that Van Antwerp, et al. fails

to anticipate or render unpatentably obvious the apparatus for analyzing a base sequence claimed herein. Withdrawal of the rejection is accordingly respectfully requested.

Reconsideration is respectfully requested of the rejection of claims 14-15, 17, 20-21, 23 and 25 under 35 U.S.C. 102(b) as being anticipated by Yasuda, et al. (US Patent No. 6,093,370, issued July 25, 2000).

The cited Yasuda, et al. reference discloses a polynucleotide separation method and apparatus for performing same. As shown in Figures 3 and 11, the apparatus includes an electrically conductive film 131, and target polynucleotide hybridization areas 141, 142, 143, 144, 145 and 146 disposed atop the film 131. Polynucleotides 41, 42, 43, and 46 are hybridized onto the probe hybridization layer 221, adjacent to the electrically insulative layer 222, of each of the target polynucleotide hybridization areas.

As with the cited Van Antwerp, et al. reference, the cited Yasuda, et al. reference fails to disclose an apparatus for analyzing a base sequence, including "*a thin polymeric gel film formed on the front surface of the first board for allowing a base sequence test sample to be stretched and immobilized on the thin film, said thin polymeric gel film having depressions and projections, said projections and depressions having a pitch within a range of from 0.1 μm to 10 μm*", as now claimed in all claims herein. The apparatus of the present invention, which includes said thin polymeric gel film, allows the immobilization, electrostatic orientation, and stretching of DNA upon same, such that the DNA may be cut at the depressions 6 formed in the thin film.

The electrically conductive film 131, and the target polynucleotide hybridization areas, are structurally separate, and not equivalent to, the thin polymeric gel film claimed herein.In

particular, Yasuda, et al. fails to disclose a thin polymeric gel film having projections and depressions therein, which may be heated and vaporized, so as to cut DNA, stretched and immobilized thereon, at the depression areas.

Furthermore, such a structure, as taught in Yasuda, et al. does not allow DNA to be stretched across and immobilized upon a plurality of projections, so that the DNA may be cut at the areas of the depressions formed between the projections, as provided by the apparatus of the present invention. That teaching comes only from the present invention, and constitutes an important element or aspect thereof.

In view of the amendments to base claims 14 and 15 herein, as well as the deficiencies of the cited reference herein, it is believed that Yasuda, et al. fail to anticipate or render unpatentably obvious the apparatus of the present invention as now claimed herein. Withdrawal of the rejection is accordingly respectfully requested.

In view of the foregoing, it is respectfully submitted that the application is now in condition for allowance, and early action and allowance thereof is accordingly respectfully requested. In the event there is any reason why the application cannot be allowed at the present time, it is respectfully requested that the Examiner contact the undersigned at the number listed below to resolve any problems.

Respectfully submitted,
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CERTIFICATE OF MAILING

I hereby certify that this Amendment in Docket No. MIT-044-USA-P, Serial No. 10/691,560, filed October 24, 2003, is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
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on July , 2006.

Donald E. Townsend, Jr.